

CLAIMS

What is claimed is:

1. A gas regulator comprising:
 - a delivery valve assembly comprising a delivery outlet and a delivery
 - 5 valve member engageable with the delivery outlet for controlling flow of a gas;
 - a timing gas chamber for receiving gas, gas pressure within the timing
 - gas chamber controlling the operation of the delivery valve member; and
 - a user adjustment system for controlling the amount of time required for
 - the gas to sufficiently fill the timing gas chamber to control the length of time
 - 10 that the delivery valve assembly is opened.
2. The gas regulator of Claim 1 in which the adjustment system includes an orifice member having more than one orifice, each of a different size, which can be selectively positioned for selecting the flow rate of the gas into the timing gas chamber.
- 15 3. A gas regulator comprising:
 - a delivery valve assembly comprising a delivery outlet and a delivery
 - valve member engageable with the delivery outlet for controlling flow of a gas;
 - a timing gas chamber for receiving gas, gas pressure within the timing
 - gas chamber controlling the operation of the delivery valve member; and
 - 20 an adjustment system for controlling the amount of time required for the
 - gas to sufficiently fill the timing gas chamber to control the length of time that
 - the delivery valve assembly is opened, the adjustment system including a
 - volume adjustment device for adjusting the volume of the timing gas chamber.

4. The gas regulatory of Claim 3 in which the volume adjustment device includes an adjustable piston.
5. A gas regulator comprising:
 - a gas reservoir system for storing deliverable gas, the gas reservoir system having a gas containing capacity;
 - a capacity adjustment system for adjusting the capacity of the reservoir system; and
 - a delivery valve assembly comprising a delivery outlet and a delivery valve member engageable with the delivery outlet for controlling the flow of gas from the gas reservoir system.
6. The gas regulator of Claim 5 in which the gas reservoir system includes a plurality of reservoirs.
7. The gas regulator of Claim 6 in which the capacity adjustment system allows selected reservoirs to be connectable in communication with each other for selecting the capacity of the gas reservoir system.
8. The gas regulator of Claim 7 in which the capacity adjustment system includes a movable plate having a series of orifices therethrough, whereby the capacity of the gas reservoir system can be selected by selecting the position of the movable plate.
9. The gas regulator of Claim 7 in which a tail flow passes through the selected reservoirs.
10. The gas regulator of Claim 9 further comprising a continuous flow circuit that can be selected to provide additional flow to the tail flow.

11. A method of regulating gas with a gas regulator comprising:
providing a delivery valve assembly comprising a delivery outlet and a delivery valve member engageable with the delivery outlet for controlling flow of a gas;
- 5 receiving gas in a timing gas chamber, gas pressure within the timing gas chamber controlling the operation of the delivery valve member; and
controlling the amount of time required for the gas to sufficiently fill the timing gas chamber with a user adjustment system to control the length of time that the delivery valve assembly is opened.
- 10 12. The method of Claim 11 in which the adjustment system includes an orifice member having more than one orifice, each of a different size, the method further comprising selectively positioning an orifice for selecting the flow rate of the gas into the timing gas chamber.
13. A method of regulating gas with a gas regulator comprising:
15 providing a delivery valve assembly comprising a delivery outlet and a delivery valve member engageable with the delivery outlet for controlling flow of a gas;
- receiving gas in a timing gas chamber, gas pressure within the timing gas chamber controlling the operation of the delivery valve member; and
20 controlling the amount of time required for the gas to sufficiently fill the timing gas chamber with an adjustment system to control the length of time that the delivery valve assembly is opened, the adjustment system including a volume adjustment device for adjusting the volume of the timing gas chamber.
14. The method of Claim 13 further comprising providing the volume adjustment device with an adjustable piston.
- 25

15. A method of regulating gas with a gas regulator comprising:
storing deliverable gas in a gas reservoir system, the gas reservoir system
having a gas containing capacity;
adjusting the capacity of the gas reservoir system with a capacity
5 adjustment system; and
controlling the flow of gas from the gas reservoir system with a delivery
valve assembly comprising a delivery outlet and a delivery valve member
engageable with the delivery outlet.
16. The method of Claim 15 further comprising providing the gas reservoir system
10 with a plurality of reservoirs.
17. The method of Claim 16 further comprising selecting the capacity of the gas
reservoir system with the capacity adjustment system which allows selected
reservoirs to be connectable in communication with each other.
18. The method of Claim 17 in which the capacity adjustment system includes a
15 moveable plate having a series of orifices therethrough, the method further
comprising selecting the capacity of the gas reservoir system by selecting the
position of the moveable plate.
19. The method of claim 17 further comprising providing a tail flow that passes
through the selected reservoirs.
20. The method of Claim 19 further comprising selecting a continuous flow circuit
20 for providing additional flow to the tail flow.